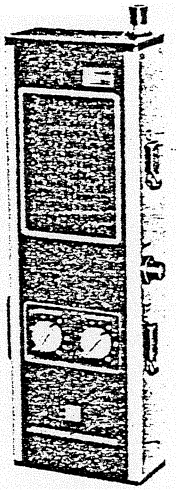
ORDER NO. RD-664

NATIONAL PANASONIC

# Service Manual

## 2-CHANNEL CITIZEN BAND TRANSCEIVER

## MODEL RJ-20EB



## SPECIFICATIONS

| | |
|---|---|
| Frequency Range: | 26.965 MHz (Channel A)<br>27.275 MHz (Channel B) |
| Intermediate Frequency: | 455 kHz |
| Transistors: | 2SC921 Receiver RF Amplifier<br>2SC920 Receiver Converter<br>2SC829 Receiver 1st IF Amplifier<br>2SC829 Receiver 2nd IF Amplifier<br>2SB173 Receiver Pre Amplifier<br>2SB173 1st AF Amplifier<br>2SB175 2nd AF Amplifier<br>2SB324, 2SB324 Power & Modulation Amplifier<br>2SC478 Transmitter Oscillator<br>2SC697 Transmitter Last Stage Amplifier<br>2SC828 Squelch |
| Diodes: | O A 9 0 D. AGC<br>O A 9 0 AGC & ANL<br>O A 9 0 Detector<br>O A 9 0 AF Detector<br>1S1211 ANL<br>MC-2 ANL<br>1S1211, 1S1211 Operation Compensator<br>SD-1Y, SD-1Y Protect |
| Sensitivity: | 0.5μV for 50 mW Output<br>1.1μV/m for S/N=10 dB Quieting |
| Power Output: | Receiver 500 mW Maximum<br>Antenna 500 mW |
| Batteries: | 12V (Eight "AA" Size Penlight Batteries)<br>(NATIONAL UM-3 or equivalent) |
| Speaker & Microphone: | 6.5 cm (2½") PM Dynamic Speaker, Imp. 8Ω |
| Cabinet Dimensions: | 85 (Wide) × 261 (High) × 45 (Deep) mm<br>(3⅜" × 10⅜" × 1¾") |
| Weight: | 880 g. (1 lb. 15 oz.) without batteries |
| Impeadance: | Earphone Jack 8Ω<br>Microphone Jack 8Ω |

<EXPORT DIVISION>
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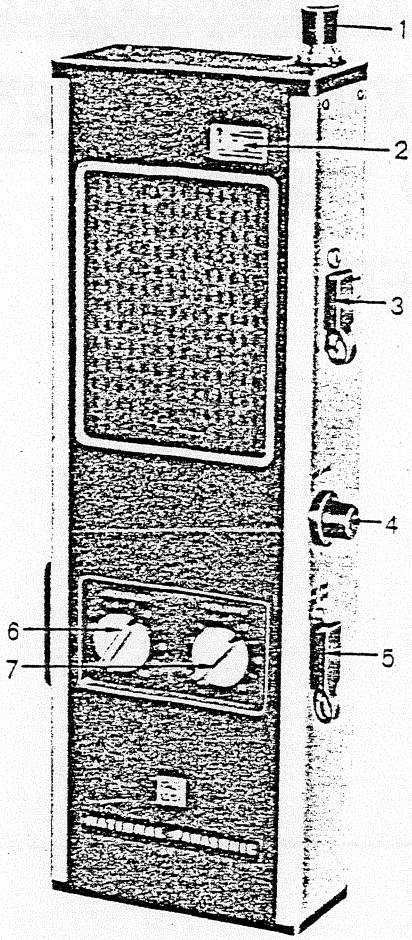
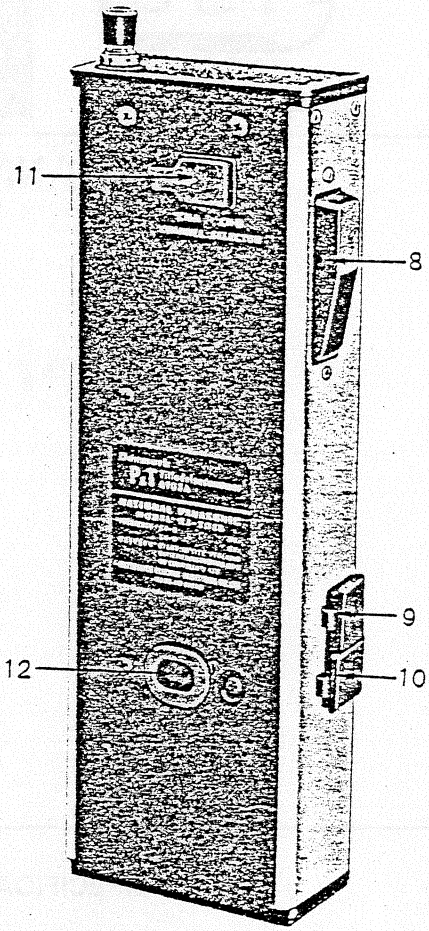
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
RADIO and STEREO DIVISION

## LOCATION OF CONTROL




1—TELESCOPIC WHIP ANTENNA
2—LEVEL METER
3—ANTENNA SELECTOR SWITCH
4—EXTERNAL ANTENNA JACK
5—EXTERNAL POWER JACK
6—SQUELCH CONTROL
7—POWER SWITCH/VOLUME CONTROL
8—PUSH TO TALK SWITCH
9—EARPHONE JACK
10—MICROPHONE JACK
11—CHANNEL SELECTOR SWITCH
12—PUSH BUTTON

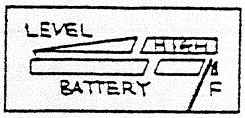
## ALIGNMENT INSTRUCTIONS

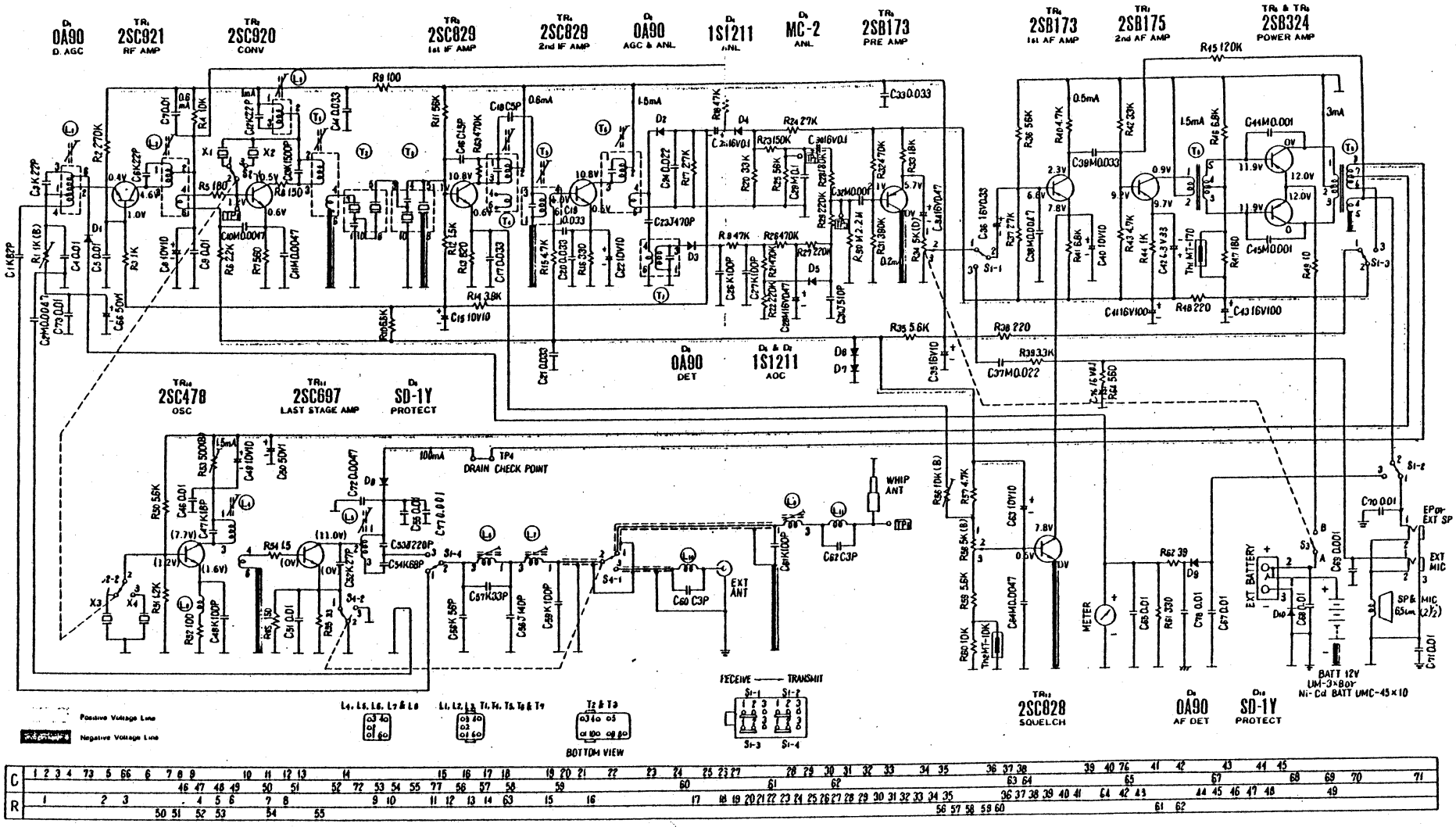
**Equipment Required**

1. Signal Generator
2. VTVM with RF Probe
3. Audio Output Indication (Voltmeter)
4. DC Milliameter or Tester
5. RF VTVM

**Note:** Lead connections in set-up should be kept as short as possible.

### LEVEL METER ALIGNMENT

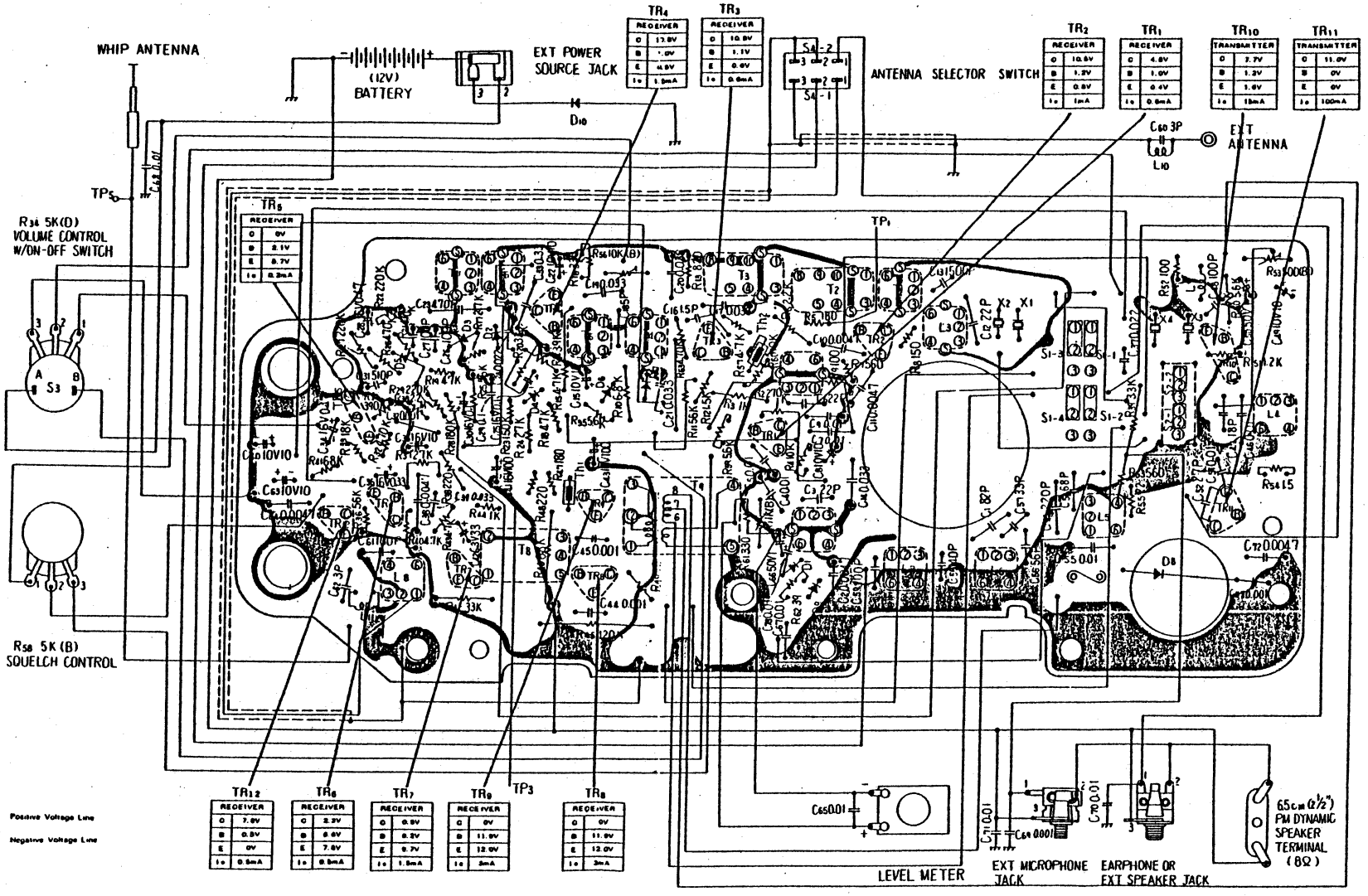
| TRANSCEIVER SETTING | ADJUSTMENT | REMARKS |
|---|---|---|
| Power Source.....<br>13 volts DC<br>Push To Talk Switch<br>.....Receiver (no signal) | $R_1$<br>(Meter Control) | Adjust $R_1$ (1 KΩ) so that pointer of the meter stays as shown in figure below.<br>  |




**Notes :**

1. $S_{1-1}$~$S_{1-4}$ : Push to talk switch in "Receive" position.
2. $S_{2-1}$~$S_{2-3}$ : Channel selector switch in "CH-A" position.
3. $S_3$ : Power source switch in "OFF" position.
4. $S_{4-1}$~$S_{4-3}$ : Antenna selector switch in "WHIP ANT" position.
5. DC voltage measurements are taken with circuit tester (10KΩ/V) from negative terminal of battery.
   ( ).....Transmitter position
6. Battery Current :
   Receiver .....14 mA (at no input signal)
   72 mA (at maximum output)
   Transmitter.....130 mA

# Circuit Board Wiring View—Model RJ-20EB




| TR12 D | TR12 | TR8 | TR6 | D5 | TR7 | D3 | D2 | D4 | TR4 | D10 | TR9 | TR8 | D6 | D7 | TR3 | TR1 | D1 | D9 | TR2 | | | | | | D8 | TR10 | TR11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12 L | | | L11 | | L8 | | T7 | | T6 | | T8 | | T5 | | T4 | T9 | | T3 | | L2 | T2 | L1 | | T1 | L7 | L3 | | L6 | | | L5 | L10 | | L9 | | L4 |

## TRANSMITTER ALIGNMENT

Set volume control to maximum.
Set squelch control to minimum.
Set push to talk switch to transmitter (Pressed Position).
Set antenna selector switch to WHIP ANT.
Set channel selector switch to CH-A.
Set power source voltage to 12volts DC.

**Note :**
1. Do not adjust cores of $L_6$ and $L_7$.
2. Remove shorting link from its terminals and mount if after compliting alignment.

| STEP | ALIGNMENT | ADJUSTMENT | REMARKS |
|---|---|---|---|
| 1 | OSC | $L_4$ (OSC COIL) | Adjust $L_4$ for maximum indication on milliameter and back down ½ turn. |
| 2 | LAST STAGE | $L_5$ (LAST STAGE COIL) | Adjust $L_5$ for minimum indication on milliameter. |
| 3 | ANT | $L_8$ (LOADING COIL) | Adjust $L_8$ for maximum indication on VTVM. |
| 4 | Repeat Step 2 and 3 | $L_5$, $L_8$ | As above |
| 5 | CURRENT | $R_{53}$ (CURRENT CONTROL) | Adjust $R_{53}$ for 100mA indication on milliameter. |
| 6 | Repeat Step 1 | $L_4$ | As above |

## RECEIVER ALIGNMENT

Set volume control to maximum.
Set squelch control to minimum.
Set push to talk switch to receiver (Unpressed Position).
Set antenna selector switch to WHIP ANT.
Set channel selector switch to CH-A.
Set power source voltage to 12 volts DC.

| STEP | ALIGNMENT | SIGNAL GENERATOR | ADJUSTMENT | REMARKS |
|---|---|---|---|---|
| 1 | IF | 455 kHz 1000 Hz Mod. | $T_1$, $T_4$, $T_5$, $T_6$, $T_7$ (IFT) | Pull up the core of $L_3$, and adjust $T_1$, $T_4$, $T_5$, $T_6$ & $T_7$ for maximum audio output. |
| 2 | Repeat Step 1 | 〃 | 〃 | As above. |
| 3 | IF | 〃 | $T_5$ | Down the core of $T_4$, and adjust $T_5$ for maximum audio output. |
| 4 | 〃 | 〃 | $T_4$ | Adjust $T_4$ for maximum audio output. |
| 5 | ANT | 27 MHz Band 1000 Hz Mod. | $L_1$ (ANT COIL) | Adjust $L_1$ for maximum audio output. |
| 6 | DET | 〃 | $L_2$ (DET COIL) | Adjust $L_2$ for maximum audio output. |
| 7 | Repeat Step 5 and step 6. | 〃 | $L_1$, $L_2$ | As above |
| 8 | ANT | 〃 | $L_1$ | Adjust $L_1$ for maximum audio output. and down ½ turn. |
| 9 | OSC | 〃 | $L_3$ (OSC COIL) | Adjust $L_3$ for 100mV indication on VTVM. |

**Notes :**
1. In all the above alignments, keep signal generator output low enough to maintain reading of 0.5 volts or less on VTVM to avoid AGC action.
2. Use only non-metallic alignment tools to insure proper alignment.
3. After alignment has been completed, all coil slugs that have been moved during alignment should be rewaxed to insure stability of operation with same type wax originally used.

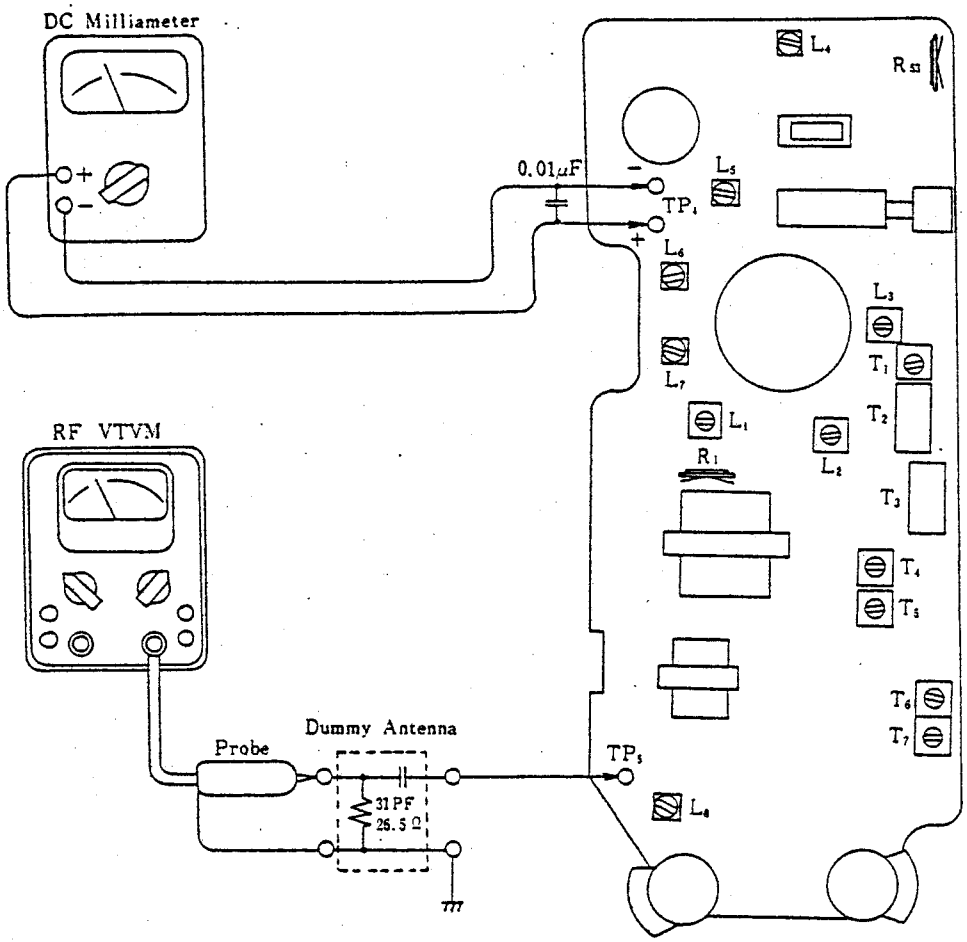



Fig. 1 Test Equipment Set-Up for Transmitter Alignment.

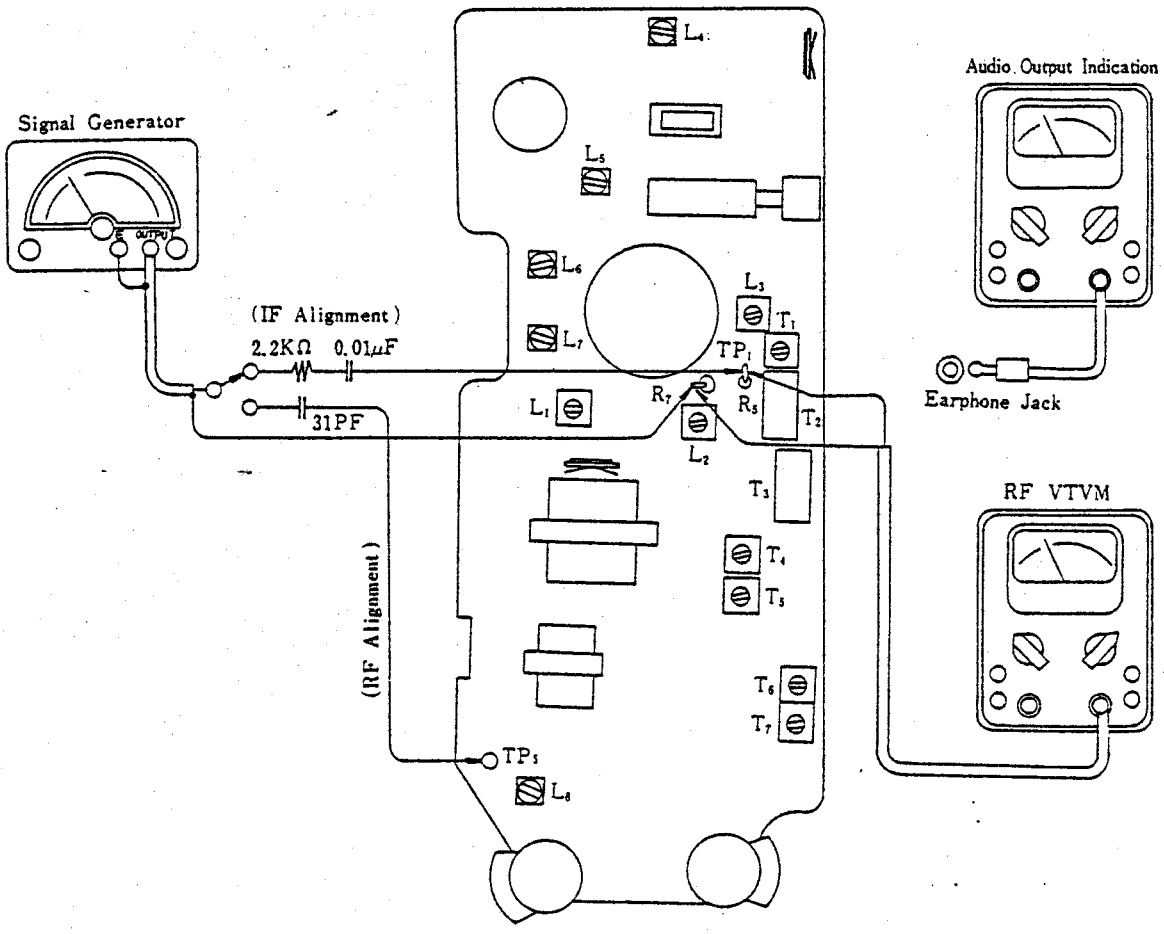



Fig. 2 Test Equipment Set-Up for Receiver IF and RF Alignment.

## TO REMOVE CHASSIS

Remove two (2) control knobs from cabinet front.

Hold transceiver in a horizontal position with back side facing up: PUSH the button on the back of the unit, and the battery case will eject itself. Do not allow the battery case to fall.

Remove five (5) cabinet back cover mounting screws, nos. 1~5, as illustrated in fig. 2.

4. Remove red whip antenna mounting screw as illustrated in fig. 1.
5. Remove five (5) red chassis mounting screws, nos. 1~5, as illustrated in fig. 3.
6. To remove chassis completely, unsolder leadwires to level meter, earphone, microphone, antenna selector switch, EXT power source jack and speaker terminals.
7. To reassemble, reverse the above procedure.

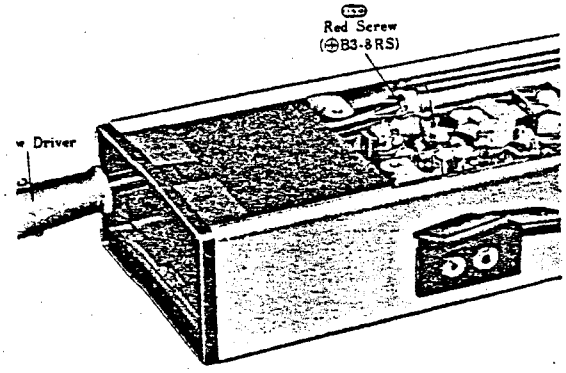



Fig. 1

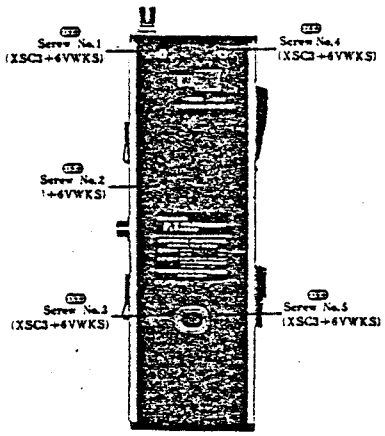


Fig. 2

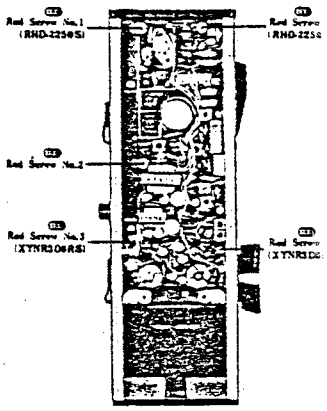
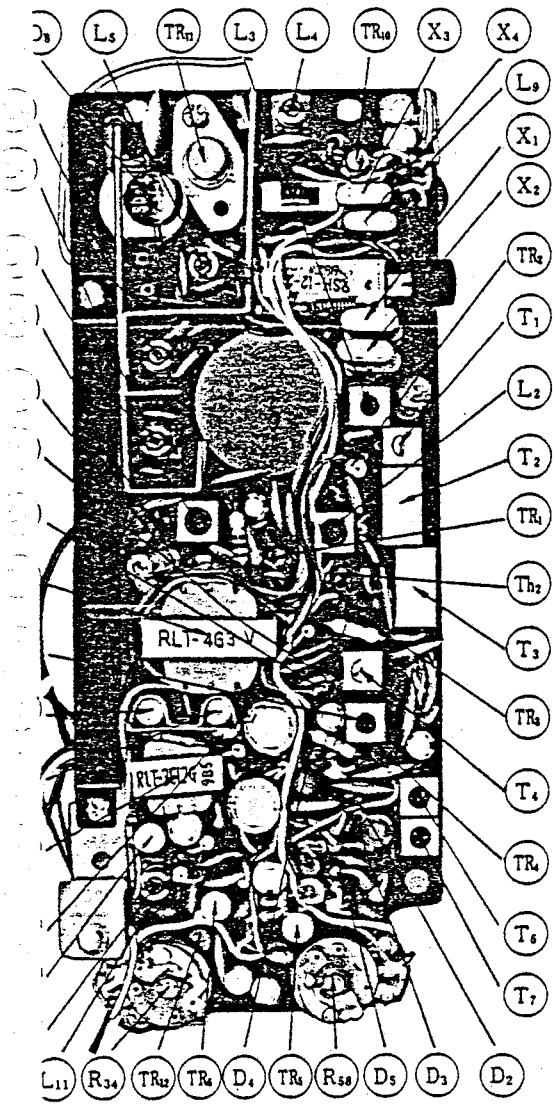
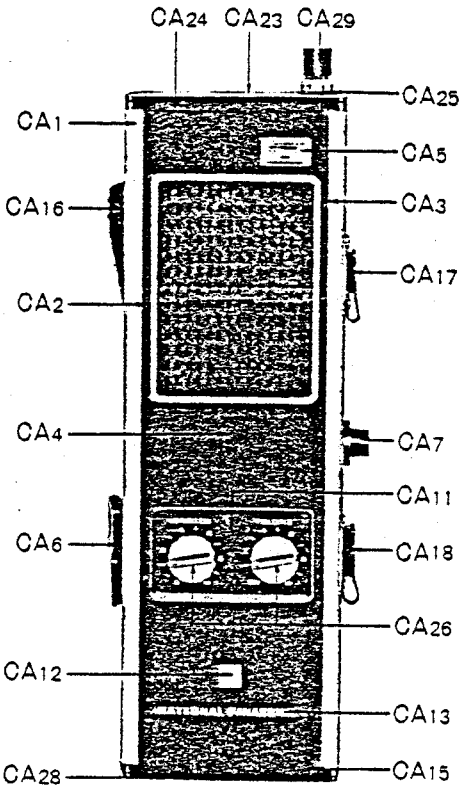


Fig. 3

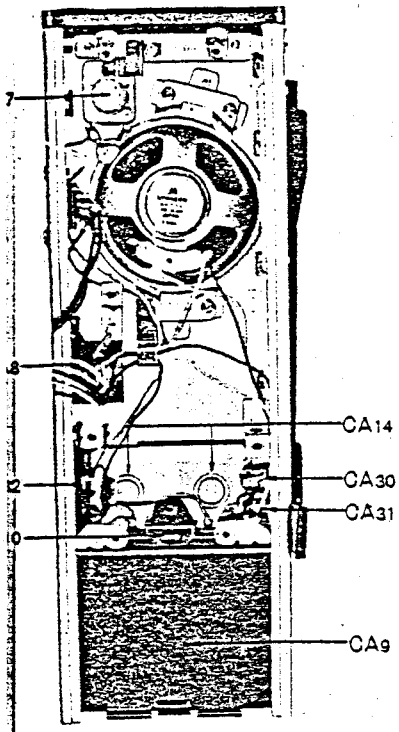
## TRANSISTORS, DIODES, COILS, TRANSFORMERS & CRYSTALS RARTS LOCATION

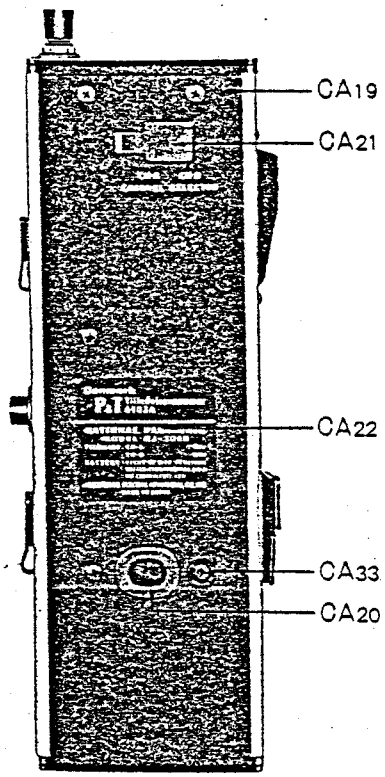


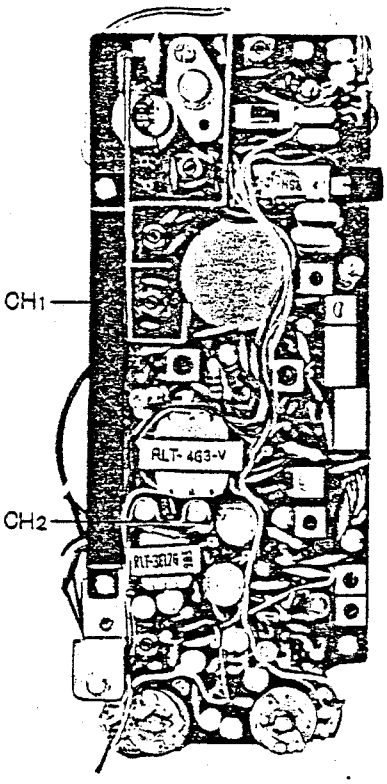

## ■ CABINET PARTS LOCATION



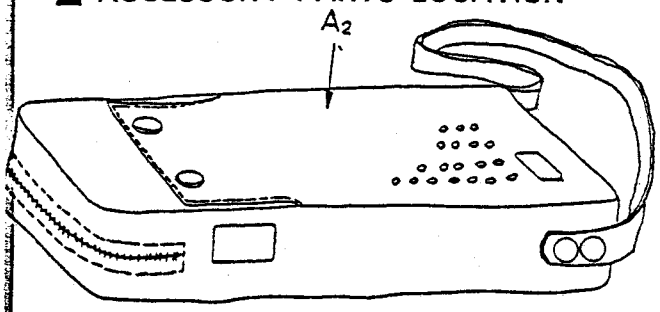
## ■ CHASSIS PARTS LOCATION

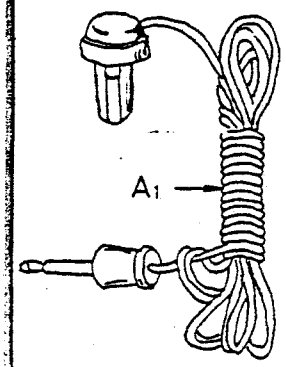


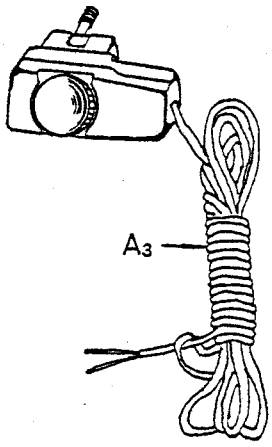



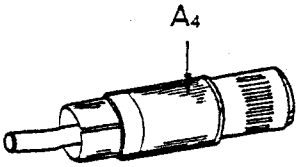




## ■ ACCESSORY PARTS LOCATION

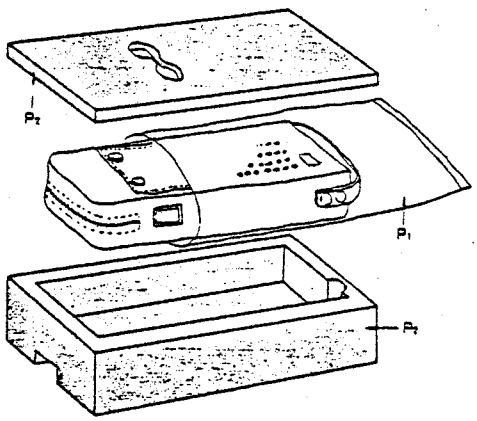


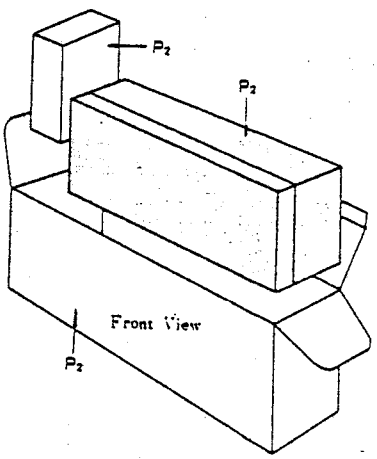




## ■ COMPONENT PACKING PARTS LOCATION



# REPLACEMENT PARTS LIST
# RADIO MODEL RJ-20EB

NOTES: 1. Part numbers are indicated on most mechanical parts. Please use this number, for parts which have no Ref. No.
2. ISO metric thread screws & parts which employ ISO metric thread screws are identified by ISO marking ( ISO ).
3. Ⓝ indicates the New Parts.

RJ-20EB

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| **TRANSISTORS AND DIODES** | | | | | | |
| $TR_1$ | 2SC921 | RF Amplifier | 1 | | | |
| $TR_2$ | 2SC920 | Converter | 1 | | | |
| $TR_3$ | 2SC829 | 1st IF Amplifier | 1 | | | |
| $TR_4$ | 2SC829 | 2nd IF Amplifier | 1 | | | |
| $TR_5$ | 2SB173 | Pre Amplifier | 1 | | | |
| $TR_6$ | 2SB173 | 1st AF Amplifier | 1 | | | |
| $TR_7$ | 2SB175 | 2nd AF Amplifier | 1 | | | |
| $TR_{8,9}$ | 2SB324 | Power Amplifier (push-pull) | 2 | | | |
| $TR_{10}$ | 2SC478 | Transmitter Oscillator | 1 | | | |
| $TR_{11}$ | 2SC697 | Last Stage Amplifier | 1 | | | |
| $TR_{12}$ | 2SC828 | Squelch | 1 | | | |
| $D_1$ | OA90 | D.AGC | 1 | | | |
| $D_2$ | OA90 | AGC & ANL | 1 | | | |
| $D_3$ | OA90 | Detector | 1 | | | |
| $D_4$ | 1S1211 | ANL | 1 | | | |
| $D_5$ | MC-2 | ANL | 1 | Ⓝ | | |
| $D_{6,7}$ | 1S1211 | Operation Compensator | 2 | | | |
| $D_{8,10}$ | SD-1Y | Protect | 2 | | | |
| $D_9$ | OA90 | AF Detector | 1 | | | |
| | | | | | | |
| **THERMISTORS** | | | | | | |
| $Th_1$ | MT-170 | Temperature Compensator | 1 | | | |
| $Th_2$ | MT-10K | Temperature Compensator | 1 | | | |
| | | | | | | |
| **CRYSTALS** | | | | | | |
| $X_1$ | HC-25/U27.420(D) | Receiver | 1 | Ⓝ | | |
| $X_2$ | HC-25/U27.460(D) | Receiver | 1 | Ⓝ | | |

**RJ-20EB**

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| | | **CRYSTALS** | | | | |
| $X_3$ | HC-25/U26.965($B_1$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.005($B_1$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U26.965($B_2$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.005($B_2$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U26.965($B_3$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.005($B_3$) | Transmitter | 1 | | | |
| $X_1$ | HC-25/U27.510(D) | Receiver | 1 | Ⓝ | | |
| $X_2$ | HC-25/U27.540(D) | Receiver | 1 | Ⓝ | | |
| $X_3$ | HC-25/U27.055($B_1$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.085($B_1$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U27.055($B_2$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.085($B_2$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U27.055($B_3$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.085($B_3$) | Transmitter | 1 | | | |
| $X_1$ | HC-25/U27.610(D) | Receiver | 1 | Ⓝ | | |
| $X_2$ | HC-25/U27.640(D) | Receiver | 1 | Ⓝ | | |
| $X_3$ | HC-25/U27.155($B_1$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.185($B_1$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U27.155($B_2$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.185($B_2$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U27.155($B_3$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.185($B_3$) | Transmitter | 1 | | | |
| $X_1$ | HC-25/U27.710(D) | Receiver | 1 | Ⓝ | | |
| $X_2$ | HC-25/U27.730(D) | Receiver | 1 | Ⓝ | | |
| $X_3$ | HC-25/U27.255($B_1$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.275($B_1$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U27.255($B_2$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.275($B_2$) | Transmitter | 1 | | | |
| $X_3$ | HC-25/U27.255($B_3$) | Transmitter | 1 | | | |
| $X_4$ | HC-25/U27.275($B_3$) | Transmitter | 1 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | **COILS AND TRANSFORMERS** | | | | |
| $L_1$ | RLA-784-T | Receiver Antenna Coil | 1 | Ⓝ | | |

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| $L_2$ | RLD-7B4-T | Receiver Detector Coil | 1 | Ⓝ | | |
| $L_3$ | RLO-7B5-T | Receiver Oscillator Coil | 1 | Ⓝ | | |
| $L_4$ | RLO-7N1-T | Transmitter Oscillator Coil | 1 | Ⓝ | | |
| $L_5$ | RLA-7N4-T | Transmitter Final Coil | 1 | Ⓝ | | |
| $L_{6,7}$ | RLA-7N6-T | Filter Coil | 2 | Ⓝ | | |
| $L_8$ | RLA-7N5-T | Loading Coil | 1 | Ⓝ | | |
| $L_9$ | RLQ-X20G-1 | Choke Coil | 1 | | | |
| $L_{10,11}$ | RLQ-Y25S-5 | Trap Coil | 2 | | | |
| $T_1$ | RLI-2B152-M | 1st IF Transformer | 1 | | | |
| $T_2$ | EIC-7D611A | Ceramic Filter | 1 | Ⓝ | | |
| $T_3$ | EIC-7D611B | Ceramic Filter | 1 | Ⓝ | | |
| $T_4$ | RLI-2B250-M | 2nd IF Transformer(Primary) | 1 | | | |
| $T_5$ | RLI-2B457-M | 2nd IF Transformer(Secondary) | 1 | | | |
| $T_6$ | RLI-2B451-M | 3rd IF Transformer(Primary) | 1 | | | |
| $T_7$ | RLI-2B451-M | 3rd IF Transformer(Secondary) | 1 | | | |
| $T_8$ | RLT-3E12 | Input Transformer P=8KΩ : S=4KΩ | 1 | | | |
| $T_9$ | RLT-4G3-V | Modulation & Transmitter Output Transformer | 1 | Ⓝ | | |
| | | **CAPACITORS** | | | | |
| $C_{69}$ | ECK-D05102P | 0.001μF, 50WV, ±100%, Ceramic | 1 | | | |
| $C_{2,10,11,38,64}$ | ECK-E05472MY | 0.0047μF, 50WV, ± 20%, Ceramic | 5 | | | |
| $C_{4,5,7,9,46,51,55,65,67,68,70,71,73,75}$ | (ECK-E05103P) ECKE1H103PF | 0.01μF, 50WV, ±100%, Ceramic | 14 | | | |
| $C_{24}$ | ECK-E05223P | 0.022μF, 50WV, ±100%, Ceramic | 1 | | | |
| $C_{14,17,19,20,21,33}$ | ECK-E05333P | 0.033μF, 50WV, ±100%, Ceramic | 6 | | | |
| $C_{72}$ | (ECK-D5472P) | 0.0047μF, 500WV, ±100%, Ceramic | 1 | ECKD2H472PE | | |
| $C_{77}$ | (ECK-D5102P) | 0.001μF, 500WV, ±100%, Ceramic | 1 | ECKD2H102PE | | |
| $C_{16}$ | ECC-D051R5C | 1.5PF, 50WV, ±0.25PF, Ceramic | 1 | | | |
| $C_{60,62}$ | ECC-D05030C | 3PF, 50WV, ±0.25PF, Ceramic | 2 | | | |
| $C_{18}$ | ECC-D05050CC | 5PF, 50WV, ±0.25PF, Ceramic | 1 | | | |
| $C_{3,6,12}$ | ECC-D05220KC | 22PF, 50WV, ± 10%, Ceramic | 3 | | | |
| $C_{52}$ | ECC-D05270KC | 27PF, 50WV, ± 10%, Ceramic | 1 | | | |
| $C_{57}$ | ECC-D05330KC | 33PF, 50WV, ± 10%, Ceramic | 1 | | | |
| $C_{47}$ | ECC-D05180KC | 18PF, 50WV, ± 10%, Ceramic | 1 | | | |
| $C_{56}$ | ECM-S05560K-H | 56PF, 50WV, ± 10%, Mica | 1 | | | |
| $C_{54}$ | ECM-S05680K-H | 68PF, 50WV, ± 10%, Mica | 1 | | | |
| $C_{26,27,48,59,61}$ | ECM-S05101K-H | 100PF, 50WV, ± 10%, Mica | 5 | | | |

**RJ-20EB**

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| $C_{58}$ | ECM-S05141J-H | 140PF. 50WV.± 5%. Mica | 1 | | | |
| $C_{53}$ | ECM-S05221J-H | 220PF. 50WV.± 5%. Mica | 1 | | | |
| $C_{1}$ | ECM-S05820K-H | 82PF. 50WV.± 10%. Mica | 1 | | | |
| $C_{31}$ | ECQ-S1511JZ | 510PF. 125WV.± 5%. Styrol | 1 | | | |
| $C_{23}$ | ECQ-S1471JZ | 470PF. 125WV.± 5%. Styrol | 1 | | | |
| $C_{13}$ | ECQ-S05152KZ | 1500PF. 50WV.± 10%. Styrol | 1 | | | |
| $C_{29}$ | ECQ-G05104MZ-N | 0.1μF. 50WV.± 20%. Polyester | 1 | | | |
| $C_{32.44.45}$ | ECQ-G05102MZ-N | 0.001μF. 50WV.± 20%. Polyester | 3 | | | |
| $C_{37}$ | ECQ-G05223MZ-N | 0.022μF. 50WV.± 20%. Polyester | 1 | | | |
| $C_{39}$ | ECQ-G05473MZ-N | 0.047μF. 50WV.± 20%. Polyester | 1 | | | |
| $C_{25.30.76}$ | ECA-G16ER1-Y | 0.1μF. 16WV. Electrolytic | 3 | | | |
| $C_{36}$ | ECA-G16ER33-Y | 0.33μF. 16WV. Electrolytic | 1 | | | |
| $C_{28.34}$ | ECA-G16ER47-Y | 0.47μF. 16WV. Electrolytic | 2 | | | |
| $C_{8.15.22.40.49.63}$ | ECE-A10V10 | 10μF. 10WV. Electrolytic | 6 | | | |
| $C_{35}$ | ECE-A16V10 | 10μF. 16WV. Electrolytic | 1 | | | |
| $C_{42}$ | ECE-A6V33 | 33μF. 6.3WV. Electrolytic | 1 | | | |
| $C_{41.43}$ | ECE-A16V100 | 100μF. 16WV. Electrolytic | 2 | | | |
| $C_{50.66}$ | ECE-A50V1 | 1μF. 50WV. Electrolytic | 2 | | | |
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| | | **RESISTORS** | | | | |
| $R_{54}$ | ERD-14VK1R5 | 1.5Ω. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{49}$ | ERD-14VK100 | 10Ω. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{52}$ | ERD-14VK101 | 100Ω. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{8.65}$ | ERD-14VK151 | 150Ω. ¼Watt. ±10%. Carbon | 2 | | | |
| $R_{47}$ | ERD-14VK181 | 180Ω. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{38.48}$ | ERD-14VK221 | 220Ω. ¼Watt. ±10%. Carbon | 2 | | | |
| $R_{13}$ | ERD-14VK821 | 820Ω. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{3.44}$ | ERD-14VK102 | 1KΩ. ¼Watt. ±10%. Carbon | 2 | | | |
| $R_{12}$ | ERD-14VK152 | 1.5KΩ. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{6}$ | ERD-14VK222 | 2.2KΩ. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{17}$ | ERD-14VK272 | 2.7KΩ. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{14}$ | ERD-14VK392 | 3.9KΩ. ¼Watt. ±10%. Carbon | 1 | | | |
| $R_{40.43.57}$ | ERD-14VK472 | 4.7KΩ. ¼Watt. ±10%. Carbon | 3 | | | |
| $R_{35.50.59}$ | ERD-14VK562 | 5.6KΩ. ¼Watt. ±10%. Carbon | 3 | | | |

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| $R_{10,41}$ | ERD-14VK682 | 6.8KΩ, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{4,60}$ | ERD-14VK103 | 10KΩ, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{33}$ | ERD-14VK183 | 18KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{24,37}$ | ERD-14VK273 | 27KΩ, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{20,42}$ | ERD-14VK333 | 33KΩ, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{18,19}$ | ERD-14VK473 | 47KΩ, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{11,36}$ | ERD-14VK563 | 56KΩ, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{23}$ | ERD-14VK154 | 150KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{22,27,29}$ | ERD-14VK224 | 220KΩ, ¼Watt, ±10%, Carbon | 3 | | | |
| $R_{31}$ | ERD-14VK394 | 390KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{21,26,32}$ | ERD-14VK474 | 470KΩ, ¼Watt, ±10%, Carbon | 3 | | | |
| $R_{55}$ | ERD-14TK330 | 33Ω, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{16}$ | ERD-14VK331 | 330Ω, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{39}$ | ERD-14VK332 | 3.3KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{9}$ | ERD-14TK101 | 100Ω, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{5}$ | ERD-14TK181 | 180Ω, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{7,64}$ | ERD-14TK561 | 560Ω, ¼Watt, ±10%, Carbon | 2 | | | |
| $R_{15}$ | ERD-14TK472 | 4.7KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{46}$ | ERD-14TK682 | 6.8KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{45}$ | ERD-14TK124 | 120KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{63}$ | ERD-14TK474 | 470KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{2}$ | ERD-14TK274 | 270KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{61}$ | ERD-14TK331 | 330Ω, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{25}$ | ERD-14TK563 | 56KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{28}$ | ERD-14TK184 | 180KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{51}$ | ERD-14TK122 | 1.2KΩ, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{30}$ | ERC-12GM225 | 2.2MΩ, ½Watt, ±20%, Solid | 1 | | | |
| $R_{53}$ | EVL-T0AA00B52 | 500Ω (B), Final Current Control | 1 | Ⓝ | | |
| $R_{56}$ | EVL-T0AA00B14 | 10KΩ (B), Squelch Control | 1 | | | |
| $R_{1}$ | EVL-T0AA00B13 | 1KΩ (B), Level Meter Control | 1 | | | |
| $R_{62}$ | ERD-14VK390 | 39Ω, ¼Watt, ±10%, Carbon | 1 | | | |
| $R_{58}$ | EVH-B0BL20B53 | 5KΩ (B), Squelch Control | 1 | Ⓝ | | |
| $R_{34}$ | EVH-B0BL20D53 | 5KΩ (D), Volume Control W / ON-OFF Switch ($S_3$) | 1 | | | |
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| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| **SPEAKER** | | | | | | |
| SP | RAS-65P01 | 6.5cm(2½")PM Dynamic Speaker,8Ω | 1 | | | |
| | | | | | | |
| **SWITCHES** | | | | | | |
| $S_{1-1}$～$S_{1-4}$ | RSH-12-2 | Push To Talk Switch | 1 | Ⓝ | | |
| $S_{2-1}$～$S_{2-2}$ | RSS-152 | Channel Selector Switch | 1 | Ⓝ | | |
| $S_{4-1}$～$S_{4-2}$ | RSS-14S | Antenna Selector Switch | 1 | ISO | | |
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| **CABINET** | | | | | | |
| | RYARJ20EBX | Cabinet(Complete) | 1 | Ⓝ | | |
| | RYMRJ20EBX | Cabinet Front (Complete) | 1 | Ⓝ | | |
| $CA_1$ | RKM-3750 | Cabinet Only | 1 | Ⓝ | | |
| $CA_2$ | RHG-964 | Rubber, Cabinet Left Side | 1 | Ⓝ | | |
| $CA_3$ | RHG-965 | Rubber, Cabinet Right Side | 1 | Ⓝ | | |
| $CA_4$ | RGC-1270 | Escutcheon | 1 | Ⓝ | | |
| $CA_5$ | RGX-807 | Panel, Level Meter | 1 | Ⓝ | | |
| | RMK-~~179~~ | Holder, EP & MIC Jack M'tg. | 1 | Ⓝ | | |
| $CA_6$ | RUV-426 | Rubber Cover, EP & MIC Jack M'tg. | 1 | Ⓝ | | |
| $CA_7$ | RMK-181 | Holder, EXT Antenna Jack M'tg. | 1 | Ⓝ | | |
| $CA_8$ | RJS-42 | Jack, EXT Antenna | 1 | Ⓝ | | |
| $CA_9$ | RJK-3004 | Cover, Battery Case | 1 | Ⓝ | | |
| $CA_{10}$ | RBC-24 | Button, Battery Case | 1 | | | |
| $CA_{11}$ | RGK-556 | Indicating Plate | 1 | Ⓝ | | |
| $CA_{12}$ | RGB-5 | Badge, National Mark | 1 | | | |
| $CA_{13}$ | RGB-199 | Badge, NATIONAL PANASONIC Mark | 1 | | | |
| $CA_{14}$ | RHG-966 | Rubber, Knob | 2 | Ⓝ | | |
| $CA_{15}$ | RHG-973 | Rubber, Cabinet Lower Side | 1 | Ⓝ | | |
| $CA_{16}$ | RUV-428 | Rubber Cover, Push To Talk Switch | 1 | Ⓝ | | |
| | ⊕B2-6K | Screw, Rubber Cover M'tg. | 2 | | | |
| $CA_{17}$ | RUV-429 | Rubber Cover, Antenna Selector Swich | 1 | Ⓝ | | |
| | ⊕B3-8KS | Screw, Rubber Cover M'tg. | 2 | ISO | | |
| $CA_{18}$ | RUV-362 | Rubber Cover, EXT Power Source Jack | 1 | | | |
| | ⊕B2-8K | Screw, Rubber Cover M'tg. | 2 | | | |
| | RYFRJ20EBX | Cover(Complete), Cabinet Back | 1 | Ⓝ | | |

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price |
|---|---|---|---|---|---|
| $CA_{19}$ | RKF-3040 | Cover Only, Cabinet Back | 1 | Ⓝ | |
| $CA_{20}$ | RUV-430 | Rubber Cover, Battery Button | 1 | Ⓝ | |
| | RUV-437 | Bushing Cover, Channel Selector Switch | 1 | Ⓝ | |
| $CA_{21}$ | RUV-429 | Rubber Cover, Channel Selector Switch | 1 | Ⓝ | |
| | ⊕B3-6KS | Screw, Rubber Cover M'tg. | 1 | ISO | |
| $CA_{22}$ | RGT-1330 | Name Plate | 1 | Ⓝ | |
| $CA_{23}$ | RKK-820 | Cover Only, Cabinet Upper Side | 1 | Ⓝ | |
| $CA_{24}$ | RHG-969 | Rubber, Cover M'tg. | 1 | Ⓝ | |
| $CA_{25}$ | RMX-185 | Bushing, Whip Antenna M'tg. | 1 | | |
| | ⊕MS2-5K | Screw, Cover M'tg. | 1 | | |
| $CA_{26}$ | RBN-190 | Knob, Squelch & Volume | 2 | | |
| $CA_{27}$ | V-20B | Level Meter | 1 | Ⓝ | |
| $CA_{28}$ | RJK-3003 | Case, Battery | 1 | Ⓝ | |
| | RJE-3-2 | Adaptor, Battery Case | 1 | Ⓝ | |
| | RGK-262 | Indicating Plate, Battery Case | 1 | | |
| $CA_{29}$ | XEARBV159LAS | Whip Antenna | 1 | ISO | |
| | RBC-29-1 | Button, Push To TalK Switch | 1 | | |
| | RUS-47 | Spring, Button | 1 | | |
| $CA_{30}$ | RJJ-25 | Jack, Earphone | 1 | | |
| $CA_{31}$ | RJJ-51-1 | Jack, Microphone | 1 | | |
| $CA_{32}$ | RJJ-47-1 | Jack, EXT Power Source | 1 | | |
| $CA_{33}$ | RBX-33 | Cover, Cabinet Back Cover M'tg. | 1 | | |
| | ⊕B3-6VS | Screw, Cabinet Back Cover M'tg. | 1 | ISO | |
| | XSC3+6VWKS | Screw, Cabinet Back Cover M'tg. | 4 | Ⓝ ISO | |
| | ⊕B3-8RS | Red Screw, Whip Antenna M'tg. | 1 | ISO | |
| | | | | | |
| **CHASSIS** | | | | | |
| $CH_1$ | RUV-436 | Cover, Chassis | 1 | Ⓝ | |
| | RJS-20-1 | Socket, Crystal | 8 | | |
| $CH_2$ | RMY-1-4 | Heat Sink, Transistor ($TR_8$ & $TR_9$) | 1 | | |
| | RHD-2250S | Red Screw, Chassis M'tg. | 3 | Ⓝ ISO | |
| | XYNR3D8RS | Red Screw, Chassis M'tg. | 2 | ISO | |
| | | | | | |
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| **ACCESSORIES** | | | | | |
| $A_1$ | EAE-1FB | Magnetic Earphone, 8Ω | 1 | | |

| Ref.No. | Part No. | Description | Per Set (Pcs.) | Remarks | Price | |
|---|---|---|---|---|---|---|
| $A_2$ | RQK-242 | Shoulder Case (Complete) | 1 | Ⓝ | | |
| $A_3$ | RJA-23-2 | Plug, EXT Power Source | 1 | | | |
| $A_4$ | RJP-91 | Plug, EXT Antenna | 1 | Ⓝ | | |
| | | | | | | |
| **PACKING** | | | | | | |
| $P_1$ | RPP-180 | Polyethylene Cover | 1 | | | |
| $P_2$ | RPG84A | Carton Box (Complete) | 1 | Ⓝ | | |
| $P_3$ | RQX5033A | Instruction Book | 1 | Ⓝ | | |
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